

and suggestions for improvement or additional guarding required for the prevention of similar accidents. These were embodied in a report to Head Office, and the investigation into the cause of each accident was not closed until the Department was satisfied that the machine had been made as safe as practicable, and, with ordinary care on the part of the worker, further accidents with the machine or with similar machines should not occur.

Two of the fatal accidents were connected with shafting, two with lifts, and one with fire in an oxygen-container. Brief summaries taken from the fatal accident reports are as follows:—

(1) On the 5th May, 1934, the owner of a sawmill operated near Alfredton was caught in the mill shafting and killed. Prior to the accident and during the currency of the certificate a grindstone was attached to the end of a line-shaft situated near the floor of the mill. The stone was removed later, but two bolts were left in the coupling to the great danger of any person who approached the shaft when it was running. The deceased climbed over a travelling table and wire rope near the end of the shaft, and his clothing became entangled with the coupling. Since the accident the shaft has been cut close to a bearing, and it is now impossible to attach any machinery to it.

(2) Another fatal accident with shafting occurred on 26th May, 1934, at Haldane, Southland. A designing engineer, while superintending the trials and tests of a new oil-engine-driven suction dredge, approached the exposed cranking-end of the engine-shaft, which protruded some 2½ in. beyond the engine-casing. His clothes were caught by the shaft, and he received injuries from which he died. The shaft was provided with a metal guard, which had been left off by the person who started the engine shortly before the accident. The machinery had not been inspected by the Department, and until the accident was not known to exist. An improved type of guard was fitted later on the advice of the Inspector who investigated the cause of the fatality.

(3) A lift accident occurred at Auckland on 16th November, 1934, when a boy aged fourteen years was fatally crushed between the platform of a slow-moving cage of an hydraulically operated lift and an overhead beam of the lift-well opening. The lift was certificated for the carriage of goods only, and notices were exhibited prohibiting any person from riding in the lift. The lad had been personally warned by the management against going into the lift, but it was evident that he disregarded this warning and met his death when trying to enter or leave the moving cage.

Goods-only lifts are not equipped with the safety provisions required in lifts certificated for the carriage of passengers or attendants, and it is a dangerous practice for persons to ride in them. The practice is a common one, however, and the Department, recognizing the difficulty of checking it, has of late encouraged owners of goods-lifts to provide additional safety equipment permitting the issue of a certificate which would authorize an attendant to travel in the cage. The equipment required is expensive, especially in the case of very old lifts, and it is difficult to persuade the owners in this direction. When any major alterations are carried out to an existing lift the opportunity is taken to require the provision of modern safety equipment.

(4) A second fatal lift accident occurred at Wellington on the 18th February, 1935, with a modern passenger-lift operated on the automatic push-button control. A young man was found on the top of the lift-cage so seriously injured that he died the following day. No one saw the accident happen, but it is known that he ascended to the fourth floor shortly before he was found. It is assumed that, on returning after a visit to his office, he opened the landing-door and stepped into the well. In the interval between leaving and returning to the lift the lift had been called away to a lower floor.

The safety equipment of an automatic lift is such that it should not be possible to open a landing-door when the cage is away from that landing. The mechanical lock on the door is so arranged that until the cage is stopped opposite the landing the latch cannot be released and the door opened by the intending passenger.

The landing-door locks of this lift were thoroughly tested immediately following the accident and attempts to open them under the conditions prevailing at the time of the accident failed. Later it was found that if the lock at the fourth-floor door was manipulated gently it could sometimes, but not always, be opened when the cage was absent from the landing. Slight wear was found in the mechanical gear, which may have been the cause of the occasional failure to function correctly. The locks were reconditioned, but in view of their unreliability steps were taken to import electro-mechanical locks of an improved design, which, should the locking-device fail to operate, will prevent the lift being called away.

(5) An unusual type of accident occurred at Auckland on the 11th October, 1934, when a young apprenticed engineer met his death by burning. A marine boiler used as a container for the storage of oxygen was being prepared for annual inspection. At the time of the accident the deceased was engaged in cleaning the internal surfaces. He was in a confined position between nests of tubes when his clothing became ignited, and before he could be removed he was burned to death.

No lights were used in the boiler, and the cause of the fire has not been satisfactorily explained. A burnt match was found, and it is assumed that the match was struck and there was sufficient oxygen left in the container to promote rapid combustion of the boy's clothing.

In thirty-seven out of the sixty non-fatal accidents reported and investigated during the year the machines were adequately guarded and practical additions to the safety equipment could not be made. In these accidents, many of which were of a minor nature, a contributing cause was failure of the human element, and in most cases the accidents could have been avoided if complete attention had been given to the work in hand. No less than thirty-eight, or 64 per cent. of the accidents reported, were to fingers or hands, the majority of the machines concerned being saws (12), mincers (4), stitching-machines (3), power-presses (3), and guillotines (2). Woodworking machines accounted for nearly one-third of the total accidents reported.

Instructions issued to the inspecting staff during the year included a comprehensive circular dealing with the design, construction, maintenance, inspection, testing, and operation of lifts. The